JAYPEE INSTITUTE OF INFORMATION AND TECHNOLOGY

B. TECH BIOTECHNOLOGY

1st Semester

SEMESTER:1

Course Code	**18B11CI111**	**Semester Odd (specify Odd/Even)**	**Semester** I **Session** 2022-2023 **Month from:** Sep 22 To Jan 2023
Course Name	**Fundamental of Computer Programming – I (NBA Code: C111)**		
Credits	4	**Contact Hours**	3-1-0
Faculty (Names)	**Coordinator(s)**	Ms. Sarishty Gupta	
	Teacher(s) (Alphabetically)	Ms. Sarishty Gupta	

COURSE OUTCOMES		**COGNITIVE LEVELS**
C111.1	Solve problems by decomposing them into a sequence of steps and illustrate them graphically.	Apply (C3)
C111.2	Explain the basic concepts of computers including number systems.	Understand (C2)
C111.3	Develop web pages using various HTML and CSS constructs	Apply (C3)
C111.4	Comprehend and write various SQL queries for creation, insertion and retrieval of data from a single table.	Understand(C2)
C111.5	Demonstrate basic programming skills in Python.	Understand (C2)

Module No.	**Title of the Module**	**Topics in the Module**	**No. of Lectures**
1.	Logic Building	Logical problems, Flowchart, Algorithms	6
2.	Introduction to Computers and Number System	Introduction to Computer, Memory, CPU, ALU, Computational Thinking. Binary, Decimal, Octal and Hexadecimal number system and Conversion.	3
3.	HTML	Basic structure of HTML document, Tags- Headings, Paragraphs, Style, Formatting, Images, Tables, Lists, Hyperlinks, Multimedia, Frame, Forms.	8
4.	Cascading Style Sheets (CSS)	CSS Introduction, Syntax, Colors, Backgrounds, Borders, Fonts, Links, List, Tables.	6
5.	Structure Query Language (SQL)	Introduction to SQL, Create/Drop Database and Table, Select, Insert, Update, Alter, Delete, Min-Max, Count, Avg, Sum, Wildcards, Primary Key Constraints	6
6.	Python	Introduction to Python, Syntax, Variables, Datatype, Casting, Numbers, Strings, Operators, Lists, Tuples, Sets, Dictionaries, if-else condition statements, loops: while, for,	13

		functions	
		Total number of Lectures	42

Evaluation Criteria Components

Maximum Marks	
T1	20
T2	20
End Semester Examination	35
TA	25 (Attendance (5), Assignment/Mini Project/Tutorial/Quiz (20)

Total 100

Project based learning: Students in a group 2-3 will make a basic website for a product/ service of their choice using the concepts of HTML and CSS acquired during the semester. It will give practical experience of website design and develop their team work spirit. The knowledge gained will enhance their employability in the IT sector.

Recommended Reading material: Author(s), Title, Edition, Publisher, Year of Publication, etc. (Text books, Reference Books, Journals, Reports, Website,s etc. in the IEEE format)

1.	Laura Lemay, Rafe Colburn, Jennifer Kymin,"Mastering HTML, CSS & JavaScript Web Publishing", BPB Publications
2.	Thomas A. Powell, "HTML & CSS: The Complete Reference", TMH
3.	Martin C. Brown, "The Complete Reference Python", TMH
4.	Stef Maruch, AAhzMaruch, "Python for Dummies", Wiley
5.	AviSilberschatz, Henry F. Korth, and S. Sudarshan, "Database System Concepts", 6th edition, McGrawHill, 2010.
6.	User manuals supplied by department for SQL and Python

Course Code	**18B15CI111**	**Semester** Odd **(Specify Odd/Even)**	Semester:1 Session: 2022-23 Month from Sept 22 to Jan 2023
Course Name	**Computer Programming Lab I**		
Credits	2	**Contact Hours**	4
Faculty (Names)	**Coordinator(s)**	Sarishty Gupta	
	Teacher(s) (Alphabetically)	Dharmveer Singh Rajpoot, Prakash Kumar, Sarishty Gupta	

COURSE OUTCOMES		**COGNITIVE LEVELS**
CO1	Demonstrate basic structure of HTML web page using different tags.	Understand (C2)
CO2	Develop web pages using table tag, formatting tag, and hyperlinks.	Apply (C3)
CO3	Make use of Cascading style sheets and Java Scripts to develop web pages.	Apply (C3)
CO4	Explain SQL queries using MySQL to create database tables and retrieve the data from a single table.	Understand (C2)
CO5	Demonstrate the simple python programs using the constructs such as lists, tuples, dictionaries, conditions, and loops.	Understand (C2)

Module No.	**Title of the Module**	**List of Experiments**	**CO**
1.	Web page development using HTML	Basic structure of HTML, heading and formatting tags and attributes, anchor tag, image tag with different attributes.	**C174.1**
2.	Frames and Forms	Make use of Frames, Forms, and table tag in HTML for designing	**C174.2**
3.	Cascading Style sheets	Make use of style sheets to develop more creative web pages.	**C174.3**
4.	Basic Programming on Python	Write python programs using the constructs such as lists, tuples, dictionaries, conditions, loops.	**C174.5**

5.	Advanced Python Programming	Write python programs using the constructs such file I/O, and chart plotting.	**C174.5**
6.	Structured Query Language	Select, Insert, Update and Delete operations on single table using SQL.	**C174.4**

Evaluation CriteriaComponents
Maximum Marks

Eval 1	15
Eval 2	15
Lab Test 1	20
Lab Test 2	20
PBL	20 (Students will submit the mini project in a group of 2- 3 members)
Attendance	10

Total 100

PBL- Students in a group of 4-5 will be designing an efficient solution to any real-world problem using appropriate HTML, Style sheets, and Database concepts which they studies in the course.

Recommended Reading material: Author(s), Title, Edition, Publisher, Year of Publication etc.
(Text books, Reference Books, Journals, Reports, Websites etc. in the IEEE format)

1.	Laura Lemay, Rafe Colburn, Jennifer Kymin," Mastering HTML, CSS & JavaScript Web Publishing" , BPB Publications
2.	Thomas A. Powell, "HTML & CSS: The Complete Reference", TMH
3.	Martin C. Brown, "The Complete Reference Python", TMH
4.	Stef Maruch, AAhzMaruch, "Python for Dummies", Wiley
5.	AviSilberschatz, Henry F. Korth, and S. Sudarshan, "Database System Concepts", 6th edition, McGrawHill, 2010.
6.	User manuals supplied by the department for SQL & Python

Course Code	**15B11MA112**	Semester Odd	**Semester I** **Session** 2022-2023 Month from Aug 2022- Dec 2022	
Course Name	**Basic Mathematics 1**			
Credits	4		**Contact Hours**	3-1-0
Faculty (Names)	**Coordinator(s)**	Dr. Yogesh Gupta		
	Teacher(s) (Alphabetically)	Dr. Yogesh Gupta		

COURSE OUTCOMES		**COGNITIVE LEVELS**
After pursuing the above-mentioned course, the students will be able to:		
C107.1	explain the concepts of sets, relation and functions.	Understanding Level (C2)
C107.2	illustrate the concepts of complex numbers and their powers including roots.	Understanding Level (C2)
C107.3	discuss the concepts of limits, continuity and differentiability and solve related problems of differential calculus.	Applying Level (C3)
C107.4	utilize integral calculus to evaluate area under the curve.	Applying Level (C3)
C107.5	explain matrices and determinants to solve the system of linear equations.	Applying Level (C3)

Module No.	Title of the Module	List of Experiments	CO
1.	Sets, Relations and Functions	Sets and their representation. Union, intersection and compliment. Mapping or function. One-one, onto mappings, Inverse and composite mappings, Relation and their representation, types of relations, equivalence relation, partial order relation.	10
2.	Complex Numbers	Definition and geometrical representation. Algebra. Complex conjugate. Modulus and amplitude. Polar form. DeMoivre's theorem. Roots of complex numbers. Simple functions.	8
3.	Differential Calculus	Basic concept of limit and continuity. Derivative. Rules of differentiation. Tangent to a curve. Taylor's series. Maxima and minima.	8
4	Integral Calculus	Antiderivative. Fundamental theorem of calculus (statement only). Integrals of elementary functions. Substitution and partial fractions. Definite integral as a limit of sum. Properties of definite integrals. Application to areas and lengths.	8
5.	Matrices and Determinants	Matrices and Determinants: Algebra of matrices. Determinant of a square matrix. Properties of determinants. Some simple type of matrices. Inverse of a matrix. Solution of equations.	8
		Total number of Lectures	42

Evaluation Criteria

Components	**Maximum Marks**
T1	20
T2	20
End Semester Examination	35
TA	25 (Quiz, Assignments, Tutorial, PBL)
Total	100

Project based learning: Students will be divided in a group of 4-5 to collect literature and submit a report on applications of matrix in mathematical modelling of biosciences related phenomenon.

Recommended Reading material: Author (s), Title, Edition, Publisher, Year of Publication etc. (Text books, Reference Books, Journals, Reports, Websites etc. in the IEEE format)	
1.	Hass, J., Heil, C., Weir, M. D., Thomas Calculus, 14th Ed., Pearson Education, 2018.
2.	Mathematics Textbook for Class XI, NCERT, 2019.
3.	Mathematics Textbook for Class XII, NCERT, 2019.
4.	Sharma, R.D., Mathematics, Dhanpat Rai Publications, New Delhi, 2018.

Course Code	**15B11PH112**	**Semester: Odd**	**Semester: I Session:** 2022- 2023 **Month from:** July to December
Course Name	**Physics for Biotechnology**		
Credits	4	**Contact Hours**	4
Faculty (Names)	**Coordinator(s)**	Prof. Anirban Pathak	
	Teacher(s) (Alphabetically)	Prof. Anirban Pathak	

COURSE OUTCOMES		**COGNITIVE LEVELS**
C103.1	Relate historical development of optics, atomic physics and biomechanics to the modern concepts.	Remembering (C1)
C103.2	Explain the relevant concepts of optics, biomechanics, laser, atomic structure, bio-fluid mechanics, allometry and statistical distribution	Understanding (C2)
C103.3	Apply of mathematical principles and laws of physics in handling physical problems with a specific focus on the biological systems.	Applying (C3)
C103.4	Logically analyze biological systems using the laws of physics or biophysics	Analyzing (C4)

Module No.	**Title of the Module**	**Topics in the Module**	**No. of Lectures for the module**
1.	Physical Optics	Basic idea of wave and its mathematical representation, Physical optics in biotechnology, Analytical treatment of interference in Young's Double Slit experiment, Intensity distribution of fringe system, Fresnel's biprism, Newton's rings, Michelson interferometer and its application in measurement of thickness of thinfilms, Introduction to diffraction (limited to Fraunhofer class) from Single slit, double slit and Diffraction grating, Polarization, Birefringence, Practical polarizers, Quarter wave plates and half wave plates, Production and analysis of different types of polarized light. Optical activity, polarimeters and applications of optical activity in biological sciences.	19

2.	Biomechanics and allometry	Laws of Newtonian mechanics, Rigidity modulus, basic ideas of biomechanics and allometry, sports biomechanics	4
3.	Bio-fluid mechanics	Surface tension, Viscosity and flow of Newtonian fluid (e.g., blood) in elastic channel (e.g., artery), Basic ideas of rheology, biofluid mechanics and, polar and non- polar solvents	6
4.	Atomic Structure	Origin of spectral lines, spin and orbital angular momentum, Quantum numbers, Atoms in magnetic field, Zeeman effect.	7
5.	Statistical Distributions and Lasers	Principle and working of laser, Ruby Laser, Applications of lasers in biotechnology.	4
		1	**40**

Evaluation Criteria

Components Maximum

Marks

T1 20

T2 20

End Semester Examination 35

TA 25 [2 Quizzes (10 M), Attendance (10 M) and Class performance (5 M)]

Total 100

Project based Learning: Short projects will be assigned to students as assignments to develop an understanding of the role of physics in biotechnology with specific attention to applications of lasers, interferometers, etc. The projects related to allometry will develop their analytic capabilities and provide first exposure to R& D activities

Recommended Reading material: Author(s), Title, Edition, Publisher, Year of Publication etc.
(Text books, Reference Books, Journals, Reports, Websites etc. in the IEEE format)

1.	Ghatak, *Optics*, Tata McGraw Hill.
2.	A. Beiser, *Concepts of Modern Physics*, Mc Graw Hill International.
3.	Size, Function, and life story, William A Calder III, Dover, New York, 1996
4.	An Introduction to Biomechanics: Solids and Fluids, Analysis and Design by Jay D. Humphrey, Sherry L. Delange, Springer, New York, 2003.

Course Code	B19GE112	**Semester** Odd	**Semester** I **Session** 2022 -2023 Month from **July-December**
Course Name	**Bridge Course 2**		
Credits	2	**Contact Hours**	2

Faculty (Names)	**Coordinator(s)**	Dr. Susinjan Bhattacharya
	Teacher(s) (Alphabetically)	Dr. Susinjan Bhattacharya, Dr. Manisha Singh

COURSE OUTCOMES		**COGNITIVE LEVELS**
C115.1	Explain the theory of natural selection and mechanisms underlying evolution	Understand Level (C2)
C115.2	Recall methods of reproduction in plants and animals	Remember Level (C1)
C115.3	Identify new developments in agricultural biotechnology	Apply Level (C3)
C115.4	Summarize global environmental problems.	Understand Level (C2)

Module No.	**Subtitle of the Module**	**Topics in the module**	**No. of Lectures for the module**
1.	Evolution of Life	Origin of life; biological evolution and evidences for biological evolution (palaeontology, comparative anatomy, embryology and molecular evidences); Darwin's contribution, modern synthetic theory of evolution; mechanism of evolution - variation (mutation and recombination) and natural selection with examples, types of natural selection; Gene flow and genetic drift; Hardy – Weinberg's principle; adaptive radiation; human evolution.	6

2.	Reproduction	Modes of reproduction - asexual and sexual reproduction; asexual reproduction, binary fission, sporulation, budding, gem-mule formation, fragmentation, vegetative propagation in plants	5
3.	Agri-biotechnology	Animal husbandry, Plant breeding, tissue culture, single cell protein	5
4.	Environmental Issues	Radioactive waste management; ozone layer depletion; deforestation; exemplifying case study as success story addressing environmental issue(s).	4
		Total number of Lectures	**20**

Scheme of Evaluation:

Mid Term Examination: 30 marks

End Term Examination: 30 marks

Teacher's Assessment: 60 marks

PBL component: The students at the end of the course can utilize their knowledge in agro-based research and industries.

Recommended Reading material: Author(s), Title, Edition, Publisher, Year of Publication etc. (Text books, Reference Books, Journals, Reports, Websites etc. in the IEEE format)

1.	The Origin and Nature of Life on Earth: The Emergence of the Fourth Geosphere. E. Smith, H. J. Morowitz, Cambridge University Press, 2016, ISBN 978-1-107-12188-1.
2.	Agricultural Biotechnology. S. S. Purohit, J.W. Albright. Agrobios (India) Jodhpur, 2005.
3.	Environmental Biotechnology. A. Scragg, R. Tyagi. Oxford University Press, 2004.

Course Code	18B15GE112	**Semester:** Odd	**Semester:** I **Session:** 2022 -2023 **Month: August To December**
Course Name	Engineering Workshop		
Credits	1.5	**Contact Hours**	03

Faculty (Names)	**Coordinator(s)**	Prabhakar Jha, Nitesh Kumar
	Teacher(s) (Alphabetically)	Chandan Kumar, Deepak Kumar, Madhu Jhariya, Nitesh Kumar. Prabhakar Jha, Rahul Kumar, Vimal Saini

COURSE OUTCOMES		**COGNITIVE LEVELS**
C179.1	Tell the basic of manufacturing environment and various safety measures associated with it.	Remembering Level (C1)
C179.2	Apply the appropriate tools to fabricate joints utilizing work-bench tools.	Applying Level (C3)
C179.3	Create various prototypes in the carpentry trade, fitting trade, and welding trade	Creating Level (C6)
C179.4	Demonstrate the working principle of lathe, shaper and milling machines and able to fabricate the prototypes of desired shape and accuracies.	Understanding Level (C2)

Module No.	**Title of the Module**	**List of Experiments**	**CO**
1.	Carpentry	Preparation of T joint as per the given specification. Preparation of dovetail joint/ cross lap joint as per given specification.	**C179.2, C179.3**
2.	Welding Shop	To study Gas welding and Arc welding equipment and various safety measures associated with it. To make butt joint and lap joint.	**C179.1, C179.2, C179.3**
3.	Sheet Metal Shop	To prepare a square tray using GI sheet. To prepare a funnel using GI sheet.	**C179.2, C179.3**
4.	Fitting Shop	To prepare V- groove fit as per given specifications. To prepare square fit as per given specifications.	**C179.2, C179.3**

5.	Machine Shop	To perform turning, facing and grooving operation on Lathe. To perform slotting operation on Shaper Machine. To perform face milling operation on Milling Machine.	**C179.4**

Evaluation Criteria

Components	**Maximum Marks**
Viva 1	20
Viva 2	20
Report file, Attendance, and D2D	60 [File Work (20) + Attendance (10) + (Experimental Work (30)]
Total	**100**

Project based learning: Here students are divided in groups and learn about the applying of appropriate tools to fabricate joints utilizing work-bench tools which helps them in creating various prototypes in the field of

engineering and technology. In the present workshop laboratory with the application of the course outcomes,

students prepare their projects like robotic car, cutting of electronic board made of wood, etc. where application of carpentry shop, sheet metal shop and fitting shop is required.

Recommended Reading material: Author(s), Title, Edition, Publisher, Year of Publication etc. (Text books, Reference Books, Journals, Reports, Websites etc. in the IEEE format)

1.	Hajra Choudhury S.K., Hajra Choudhury A.K. and Nirjhar Roy S.K., "Elements of Workshop Technology", Vol. I 2008 and Vol. II 2010, Media promoters and publishers private limited, Mumbai
2.	Kalpakjian S. And Steven S. Schmid, "Manufacturing Engineering and Technology",4th edition, Pearson Education India Edition, 2002.
3.	Rao P.N., "Manufacturing Technology", Vol. I and Vol. II, Tata Mc GrawHill House, 2017.
4.	John K.C., Mechanical Workshop Practice, 2nd Edition, PHI, 2010
5.	Roy A. Lindberg, "Processes and Materials of Manufacture", 4th edition, Prentice Hall India, 1998
6.	Gowri P.Hariharan and A. Suresh Babu," Manufacturing Technology – I" Pearson Education, 2008
7.	Raghuwanshi B.S., Workshop Technology Vol. I & II, Dhanpath Rai & Sons.

Detailed Syllabus Lecture-wise Breakup

Course Code	15B11HS112	**Semester**: Odd	**Semester**: I **Session 2022-23** **Month: July-December**	
Course Name	ENGLISH			
Credits	3	**Contact Hours**	2-0-2	
Faculty (Names)	**Coordinator(s)**			
	Teacher(s) (Alphabetically)	Dr Ankita Das, Dr Anshu Banwari, Dr. Ekta Singh, Dr Ekta Srivastava, Dr. Debjani Sarkar, Dr Monali Bhattacharya, Dr Nilu Choudhary.		

COURSE OUTCOMES		**COGNITIVE LEVELS**
C114.1	Develop an understanding and appreciate the basic aspects of English as a communication tool.	Understand (C2)
C114.2	Apply grammar concepts and vocabulary skills in presentation and in spoken and written communication.	Apply (C3)
C114.3	Demonstrate an understanding of different forms of literature and rhetorical devices	Understand (C2)
C114.4	Examine literature as reflection of individual and society	Analyse (C4)
C114.5	Compose different forms of professional writing	Create (C6)
C114.6	Apply Phonetics through theory and practice for better pronunciation	Apply (C3)

Module No.	**Title of the Module**	**Topics in the Module**	**No. of Lectures for the module**
1.	English as a Communication Tool	Basic aspects of English: LSRW: Listening, Speaking, Reading, Writing Non-Verbal Communication: Body Language, Voice Modulation, Posture; Presentation Techniques: Self-Presentation Strategies; Types of Strategic Presentation; PPT Presentations; Using Gambits to refine Group Discussions and Interview Skills Phonetics: Pronunciation, Stress, Rhythm, Intonation	9

2.	Grammar & Vocabulary	*Parts of Speech and Agreement of Noun-Verb; Noun-Pronoun;* *Tense, Aspect, Mood and Voice* *Vocabulary Enrichment techniques: The concept of Word Formation; Root words from foreign languages and their use in English; Acquaintance with prefixes and suffixes from foreign languages in English to form derivatives; Synonyms, Antonyms, Homonyms, Homophones, Collocation.* *Error Analysis*	*6*
3	Language through Literature	**Forms of Literature & Rhetorical Devices** **Short Story** · Too Bad by Isaac Asimov **Poem** · Where the mind is without fear by Rabindra Nath Tagore **One act Play** Refund by Fritz Karinthy **Famous Speech** Swami Vivekanand's Chicago Speech	5
3.	Professional Application/Writing	Textual Organization · Letter Writing, Email Etiquettes, Feedbacks and Review Writing · Notice, Agenda and Minutes · Format of Report Writing · CV and Resume	8
		Total number of Lectures	**28**

Practical Modules

Syllabus for Reading Modules	**No. of Hours in Lab: 7**
Practical for Learning Comprehension Strategies of Reading through Activities: ● Summarizing ● Sequencing ● Inferencing ● Comparing and contrasting; Drawing conclusions ● Self-questioning ● Problem-solving; ● Newspaper reading and comprehension ● Relating background knowledge ● Distinguishing between fact and opinion ● Finding the main idea, important facts, and supporting details	5 Hrs

Practice Quick Reading through SKY Read up-Speed Up Software or SAT/CAT/IELTS exercises.	2 Hrs
Syllabus for Listening Modules	No. of Hours in Lab: 7
Practical for Mastering the Skill of Listening through Activities: • Listening for the Main Idea; Listening for Detail: 5 Ws and H questions; Listening in sequence: for order following Through Ted Talks • Listening with vocabulary through Bingo • Listening for understanding personal & social connotations through News Brief, Interviews. • Listening for non-verbal connotations through Audio-Videos and Movie Clips • Listening for Functional Language: understanding choice of words for same situation.	5 Hrs
Practice Listening through software of Sky IELTS Listening Exercises or Podcasts	2 Hrs

Syllabus for Speaking Modules	**No. of Hours in Lab: 7**
Activities based on Usage of Grammar Concepts in Communication: ● Spoken vs. Written language- Formal and Informal English (Bingo); ● Practice through JAM Session- Situational Dialogues – Greetings – Taking; Leave – Introducing Oneself and Others. Making Requests and Seeking Permissions - Telephone Etiquette.	2 Hrs
Activities for Vocabulary Enrichment: ● Cue Cards based Activities: Practice: Learning new words and and usage through various connotations and denotations; ● Practice through News Briefs & Peer Learning	2 Hrs
Activities for learning Public Speaking: ● Exposure to Structured Talks - Non-verbal Communication: Practice: Situational Dialogues –Navigating Memory Lanes and Re-creating through Role-Play- Expressions in Various Situations; ● Practice of Phonetics, Stress and Intonation while Making a Short Speech, Extempore and Making a Presentation	3 Hrs

Syllabus for Writing Modules	**No. of Hours in Lab: 7**

Grammar Practice & Exercises: ● Jumbled Paragraphs for grammar learning ● Picking the Out of Context sentence in a Jumbled Paragraph for proper communication. ● Application of right grammar concepts	2 Hrs
Practical on Different forms of writing, like persuasive writing, expository, narrative, descriptive	1 Hr
Cohesion in Writing: Application of Discourse Markers: ● Enriched vocabulary patterns in sentence structuring ● Fill in the missing vocabulary items in sentences ● Fill in the missing structural items in sentences ● Finish the text (Cloze Writing) ● Bring cohesion in writing with proper tense usage	2 Hrs
Picture composition & Precis Writing: ● Using Action Words ● Activity writing ● Information Transfer ● Experience Sharing	2 Hrs

Evaluation Criteria

Components	**Maximum Marks**
T1	20
T2: LAB Exam	20
EndSemesterExamination	35
TA	25 (Project, Lab Test, Lab File Assessment)
Total	**100**

PBL Component : The students will be assigned a group project on Creative Writing in the form of a poem, prose piece (short story) or one act play accompanied with a detailed report on rhetorical devices and the contribution of each group member.

Recommended Reading material: Author(s), Title, Edition, Publisher, Year of Publication etc. (Text books, Reference Books, Journals, Reports, Websites etc. in the IEEE format)

1.	**C.L.Bovee, J.V.Thill, M.Chaturvedi**, *Business Communication Today*,9th Ed, Pearson Education, Pvt Ltd,2021
2.	**Kelly M. Quintanilla and S.T.Wahl**, *Business and Professional Communication*, Sage Publications Pvt India Ltd,2011
3.	**S. Kumar and Pushp Lata,** *Communication Skills*, Oxford University Press,1st, Ed. 2011

4.	**R.K Bansal, and J.B Harrison**, *Spoken English for India*, Orient Longman, 2018
5	**M A Yadugiri,** The Pronunciation of English: Principles and Practice, Viva Books Pvt. Ltd, India, 2015
6	**Rabindranath Tagore,** *"Where the Mind is without Fear"* **https://allpoetry.com/where-the-mind-is-without-fear**
7	**A. R. Rizvi,** 'Effective Technical Communication' 2nd edition, McGraw Hill Education Private Limited, Chennai, 2018.
8	**Raymond Murphy,** English Grammar in Use, 5th edition, Cambridge University Press, 2019.

9	**Hewings, M**. *English Pronunciation in Use*. Advanced. Cambridge: CUP, 2009
10	**Krishna Mohan and N. P. Singh**, *Speaking English Effectively* 2nd Edition. Macmillan Publishers India Ltd. Delhi. 2011
11	**Isaac Asimov,** *"Too Bad"***,** Robot Visions, ROC Books, New York, NY, USA, 1991
12	**Suresh Kumar, E. &Sreehari, P**. *A Handbook for English Language Laboratories*. New Delhi: Foundation, 2009.
13	**Fritz Karinthy,** "*The Refund*", https://egyankosh.ac.in/bitstream/123456789/27478/1/Unit-4.pdf **.**
14	**Swami Vivekananda &Sankar Srinivasan, "Sisters**& Brothers of America: Speech at World Parliament of Religions, Chicago, 1893", Creative Space Independent Publishing Platform, 2015

Course Code	**15B17PH171**	**Semester** Odd	**Semester** I **Session** 2022-2023. **Month from:** July to December
Course Name	**Physics Lab-1**		
Credits	01	**Contact Hours**	02
Faculty (Names)	**Coordinator(s)**	Himanshu Pandey and Anshu D. Varshney	
	Teacher(s) (Alphabetically)	Alok Pratap Singh Chauhan, Amit Verma, Anuj Kumar, Anuraj Panwar, Anshu D. Varshney, Bhubesh Chander Joshi, D. K. Rai, Dinesh Tripathi, Manoj Kumar, ManojTripathi, N. K. Sharma, Navendu Goswami, Prashant Chauhan, S. C. Katyal, Sandeep Chhoker, Swati Rawal, Vikas Malik, Vivek Sajal	

COURSE OUTCOMES		**COGNITIVE LEVELS**
C170.1	Recall optics and modern physics principles behind the experiments.	Remembering (C1)
C170.2	Explain the experimental setup and the principles involved behind the experiments performed.	Understanding (C2)
C170.3	Plan the experiment and set the apparatus and take measurements.	Applying (C3)
C170.4	Analyze the data obtained and calculate the error.	Analyzing (C4)
C170.5	Interpret and justify the results.	Evaluating (C5)

Module No.	**Title of the Module**	**List of Experiments**	**CO**
1.	Optics	**1.** To determine the wavelength of sodium light with the help of Newton's rings setup **2.** To determine the wavelength of sodium light with the help of Fresnel's Bi-prism **3.** To find the specific rotation of cane- sugar solution by a polarimeter at room temperature, using half-shade / Bi-quartz device. **4.** To determine the dispersive power of the material of a prism with the help of a spectrometer. **5.** To determine the wavelength of prominent spectral lines of mercury light by a plane transmission grating sing normal incidence method	1-5

2.	Modern Physics	**6.** To study the Photoelectric effect and determine the value of Planck's constant. **7.** Determination of Planck's constant by measuring radiation in a fixed spectral range.	1-5
3.	Electricity and Magnetism	**8.** To verify Stefan's law by electrical method. **9.** To determine the resistance per unit length of Carey Foster's bridge wire and specific resistance of the material of the given wire using Carey Foster's bridge. **10.** To study the variation of magnetic field with distance, along the axis of Helmholtz galvanometer, and to estimate the radius of the coil.	1-5

Evaluation Components	**Criteria Maximum Marks**
Mid Term Viva (V1)	20
End Term Viva (V2)	20
D2D	60
Total	**100**

Recommended Reading material: Author(s), Title, Edition, Publisher, Year of Publication etc. (Text books, Reference Books, Journals, Reports, Websites etc. in the IEEE format)

1.	Dey and Dutta, *Practical Physics*, Kalyani Publication.
2.	Experiment hand-outs.